

REMARKS

Claims 1, 23 and 24 have been amended to more particularly define Applicant's claimed invention. Basis for the amendment of claims 1, 23 and 24 can be found in Examples 1 and 2 of Applicant's specification. Claims 2 and 11 have been canceled due to the incorporation of the subject matter thereof into claim 1. Claims 25, 26 and 27 have been added to more particularly define Applicant's claimed invention. Basis for the addition of claims 25, 26 and 27 can be found in original claim 1 and Examples 1 and 2 of Applicant's specification. Claims 6, 8, 9, 12, 13 and 21 have been amended to make them dependent on a non-canceled claim.

The rejection of claims 1-13 and 21-24 under 35 U.S.C. 103(a) as being unpatentable over Zurecki et al. (US 5,738,281) in view of Nowotarski et al. (US 5,486,383) and the admitted state of the prior art is respectfully traversed.

Claims 1, 23 and 24 have been amended to recite certain unexpected discoveries made by Applicant as set forth in Examples 1 and 2 of Applicant's specification. Surprisingly, Applicant has discovered that by using a gas shield when thermally spraying a ceramic material such as oxides, nitrides, and carbides, that the standoff can be extended without degradation of the microstructure or other properties of the coating. Coatings with a higher density, higher deposition efficiency, higher deposition rate, a higher segmentation crack density, and more uniform microstructure can be achieved at the extended standoff. These types of coatings can exhibit greater wear resistance, erosion resistance, higher bond strength, and other desirable properties.

These effects are thought to be due to the increased and extended temperature effect due to the shield on the thermal spray effluent. The efficacy of this discovery is illustrated in Example 2 of Appellant's specification using zirconium oxide. It was shown that the microstructures required for thermal barrier coatings could be obtained at significantly longer standoffs with a shield

than without. Moreover, at a given standoff, the microstructures were more uniform, the coatings denser, the segmentation cracks denser, and the deposition efficiency and rate higher with a shield than without. The longer standoffs make it possible to coat components such as gas turbine blades and vanes with a more complex shape than was previously possible.

Nowhere do the cited references alone or in combination disclose or suggest using a coaxial gas shield in thermal spraying a ceramic material, lengthening the standoff distance between the surface of the substrate having a complex shape and the exit end of a shielded thermal spray device (i.e., at least 20% longer than the standoff distance of a non-shielded thermal spray device) without degradation of the microstructure of the coating, and achieving coatings with a higher density, higher deposition efficiency, higher deposition rate, a higher segmentation crack density, and more uniform microstructure at the extended standoff.

In view of the amendment of claims 1, 23 and 24 and the arguments above, this rejection is deemed improper and should be withdrawn.

The rejection of claims 1-13 and 21-24 under 35 U.S.C. 103(a) as being unpatentable over Zurecki et al. (US 5,738,281) in view of Nowotarski et al. (US 5,486,383) and Taylor et al., "Experience with MCrAl and thermal barrier coatings produced via inert gas shrouded plasma deposition" is respectfully traversed.

In view of the amendment of claims 1, 23 and 24 and the arguments above, this rejection is also deemed improper and should be withdrawn.

It is respectfully submitted that the rejections of record are improper and that the application is in condition for allowance. Accordingly, reconsideration and allowance of all claims are courteously solicited.

A response to the Office Action mailed February 12, 2008 was due May 12, 2008. Accordingly, submitted herewith is a petition for an extension of time

for one (1) month. Please charge fees/surcharge which may be required by this paper, or credit any overpayment, to Deposit Account No. 16-2440.

Respectfully submitted,

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